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Q33

Consider the following statements: Statement I: Scientific studies suggest that a shift is taking place in the Earth's rotation and axis. Statement II: Solar flares and associated coronal mass ejections bombarded the Earth's outermost atmosphere with tremendous amount of energy. Statement III: As the Earth's polar ice melts, the water tends to move towards the equator. Which one of the following is correct in respect of the above statements? (a) Both Statements II and III are correct and both of them explain Statement I (b) Both Statement II and Statement III are correct but only one of them explains Statement I (c) Only one of the Statement II and III is correct and that explains Statement I (d) Neither Statement II nor Statement III is correct Official key: B.

UPSC Civil Services Prelims 2025 · General Studies · 2 marks · Environment and Ecology
Environment, ecology, climate, biodiversity - Prelims GS Paper I.

Explanation

(a)

Both II and III correct and both explain I. Solar flares and CMEs dump energy into the thermosphere and ionosphere. They do not shift the rotation axis the way ice melt does. II is true as space weather; it does not explain I.

(b) Official key

Both II and III are correct but only one of them explains I. III is the explanation: meltwater from polar ice moves toward the equator, redistributes mass, and studies report a tiny polar-motion / length-of-day signal. II is correct space physics, not the cause of I.

(c)

Only one of II and III is correct. Both statements hold; only the explanation link is one-way.

(d)

Neither. Ice-mass shift is the standard geophysics line for I.

Summary

- **Official key is (b):** solar flares (II) and meltwater moving toward the equator (III) are both real, but only ice-mass shift explains a measurable change in Earth's rotation and axis. Flares light up the outer atmosphere; they do not re-aim the pole. (a) treats both as explanations; (c) drops a true statement; (d) drops both.

Related possible facts

These can be asked in a future Prelims paper.

True polar wander / Chandler wobble neighbours

Earth's rotation axis wanders for several reasons. Ice melt is one mass-redistribution term in recent papers.

Coronal mass ejection (CME)

Magnetised plasma from the Sun. Drives geomagnetic storms. Atmosphere, not the solid-Earth axis.

Length of day

Milliseconds vary with atmosphere, ocean and ice. A neighbour of this axis PYQ.

GRACE / GRACE-FO

Satellite pair that tracks ice-mass change - the data behind many melt-and-rotation papers.

Post-glacial rebound

Land still rising after the last ice age. Another mass shift that affects rotation.

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